United States Patent [19]

Maddocks

[11] **3,710,560**

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[54] AIR CLEANER

[75] Inventor: **Gerald E. Maddocks,** Chatham, Ontario, Canada

[73] Assignee: **Fram Corporation,** East Providence, R.I.

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[52] **U.S. Cl.** **55/419,** 55/502, 55/510, 251/63

[51] **Int. Cl.** **B01d 27/08**

[58] **Field of Search**.....55/418, 419, 498, 510, 276, 55/502; 123/119 D, 127; 210/120; 251/147, 63

[56] **References Cited**

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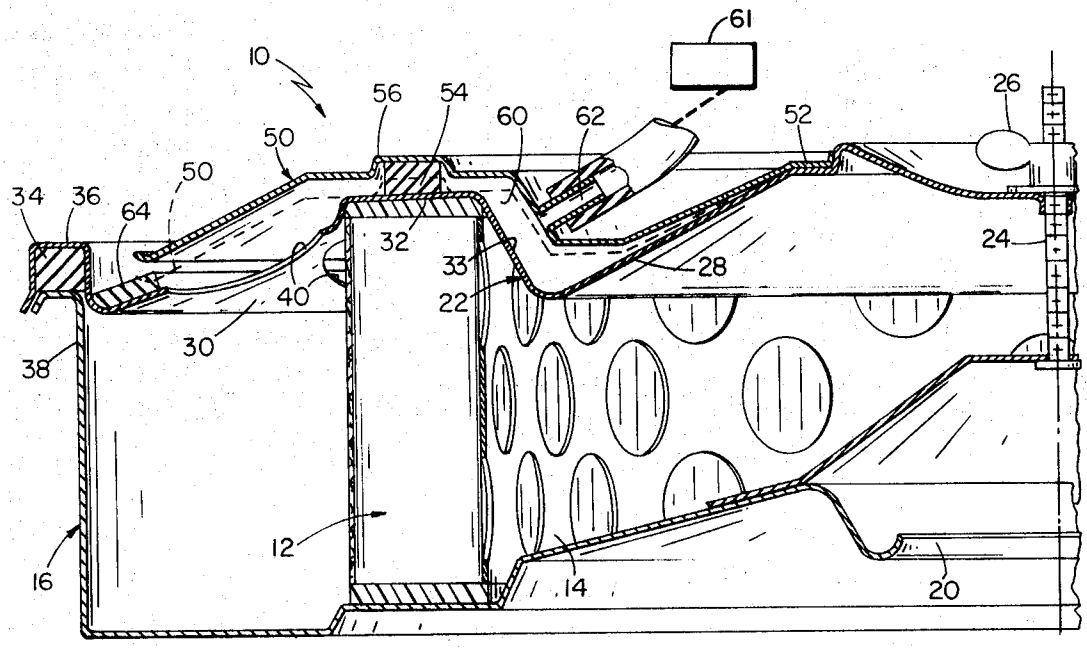
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Attorney—Robert E. Hillman

[57] **ABSTRACT**

Air cleaner with supplementary air inlet in housing cover, and second cover adjacent the first and movable between first position in which air is allowed to pass through the supplementary inlet, and second position in which such supplementary air flow is impeded.

3 Claims, 2 Drawing Figures



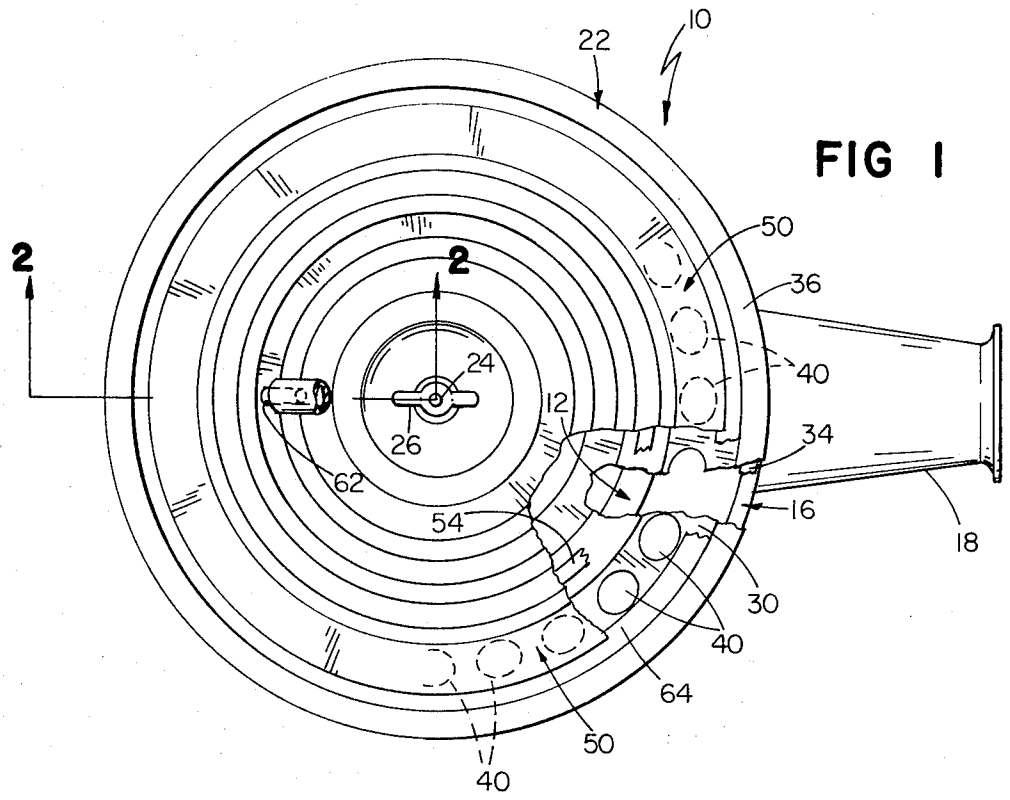

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FIG 1

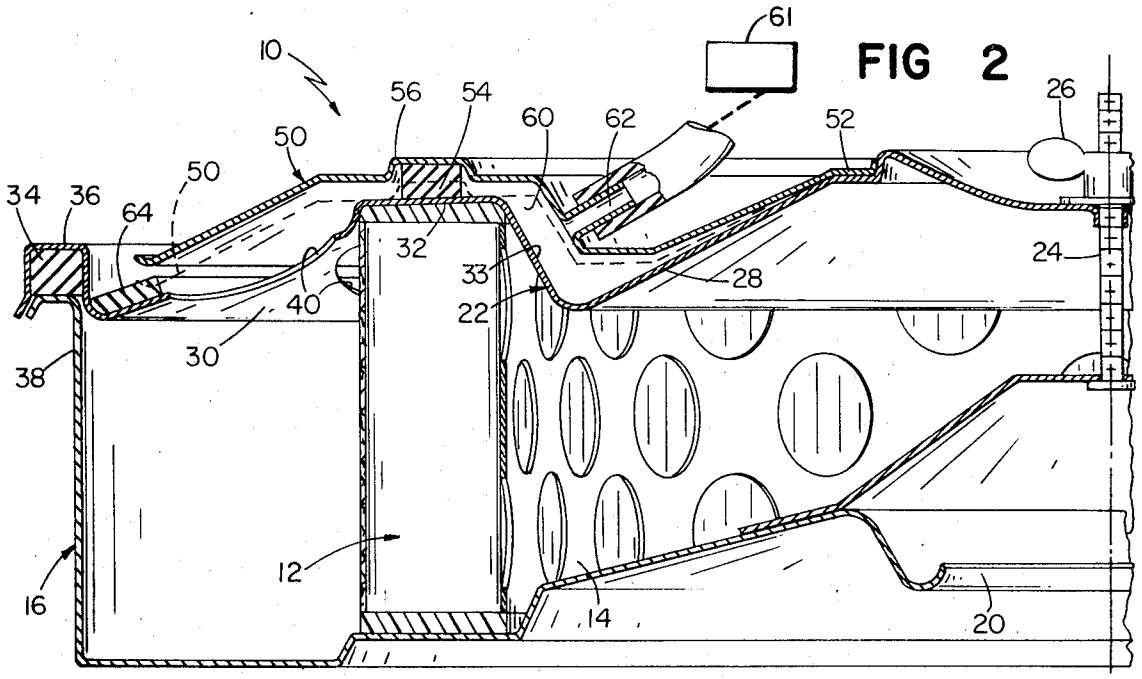

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FIG 2

AIR CLEANER

This invention relates to varying the restriction to air flow through an air cleaner for an automotive vehicle.

Objects of the invention are to provide for restriction variation in an improved manner, with simple, reliable, inexpensive structure easily adapted to existing air cleaner design.

The invention features a supplementary air inlet through the air cleaner cover, and a second cover adjacent the first and arranged to move between a first position in which air is allowed to pass through the supplementary inlet and a second position in which the second cover impedes such supplementary air flow. In preferred embodiments the second cover is annular, is sealed to the main cover at radially spaced zones to define a vacuum compartment, and has a valving portion extending radially outward of the outermost seal zone to overlie a ring of supplementary inlet holes; a vacuum source is connected to the vacuum compartment to control the spacing between the two covers; and a sealing gasket is mounted radially outward of the secondary inlets to act as a valve seat for said valving portion and hence to seal between the covers when high vacuum conditions in the compartment draw down the second cover, thereby shutting off all air supply to the supplementary inlets.

Other objects, advantages, and features will be apparent from the following description of a preferred embodiment of the invention, taken together with the drawings thereof, in which

FIG. **1** is a plan view of an air cleaner, partially broken away; and

FIG. **2** is a sectional view taken along **2—2** of FIG. **1**.

Referring to the drawings, carburetor air cleaner **10** is of conventional design to the extent that it includes cylindrical filter **12** supported around perforated center-tube **14** in housing **16** having a main air inlet tube **18** and an axial outlet **20**.

Cover **22** is held on threaded shaft **24** by wing nut **26**, and has downwardly and outwardly sloping portions **28** and **30** between which are horizontal portion **32** and upwardly sloping portion **33**. Gasket **34** is fixed in the outer rim **36** of the cover and seals against outer wall **38** when the cover is tightly in place.

A ring of supplementary air inlet holes **40** is provided in sloping cover portion **30**.

A second generally annular cover **50**, of outside diameter less than that of cover **22**, is mounted on top of cover **30**, with its inner periphery **52** adhesively sealed to cover **30**, and with a resilient gasket **54** adhesively sealed between cover portion **32** and corresponding horizontal portion **56** of cover **50**. A sealed compartment **60** is thus formed between the two covers, and is connected to the engine manifold vacuum source (shown schematically at **61**) by tube **62**. Radially outward of gasket **54** cover **50** extends generally parallel to cover portion **30**, over inlets **40**, to above sealing gasket **64** fixed between rim **36** and openings **40**.

In operation, engine vacuum manifold pressure determines the pressure in vacuum compartment **60**. At low pressures (i.e., high suction) cover **50** will be drawn toward cover **22** (see phantom position in FIG. **2**) until cover **50** seals against gasket **64**, preventing any air flow through inlets **40**. At high pressures (i.e., low suction) cover **50** moves away from gasket **64** to allow air to flow through inlets **40**, supplementing and mixing with the air flow through inlet **18**, thereby decreasing the total restriction to carburetor air flow provided by the air cleaner.

Other embodiments will occur to those skilled in the art and are within the following claims.

What is claimed is:

1. In an air cleaner for a carburetor, having a filter mounted in a housing, a cover for the housing clamping means for securing the cover to the housing, a main air inlet into the housing upstream of said filter, and an outlet downstream of said filter, that improvement comprising

a portion of said cover having a supplementary air inlet into said housing upstream of said filter,

a second cover overlying said first-mentioned cover adjacent said supplementary inlet, said covers being sealed to each other at radially spaced seal zones, said zones defining a vacuum compartment between said covers, said second cover having a valving portion extending radially outward of the radially outermost of said seal zones to overlie said supplementary inlet, and

a resilient gasket adhered to said covers at said outermost zone, to allow said second cover to approach and withdraw from said first-mentioned cover,

said compartment being connected to and communicating with a vacuum source to control the spacing between said covers and hence the position of said valving portion relative to said supplementary inlets.

2. The device of claim **1** further comprising a sealing gasket mounted radially outward of said secondary inlet and providing a valve seat for said valving portion of said second cover, to seal between said covers when high vacuum conditions in said vacuum compartment draw down said second cover, thereby shutting of all air supply to said supplementary inlet.

3. The device of claim **5** wherein

said first-mentioned cover has inner and outer downwardly and outwardly sloping portions separated by an outwardly and upwardly sloping portion and a horizontal portion,

said second cover is sealed at its inner periphery to said first-mentioned cover and has portions extending generally parallel to said portions of said first-mentioned cover, but spaced therefrom, said second cover having a horizontal portion, aligned above said first-mentioned horizontal portion,

said resilient gasket between said covers is adhered to said horizontal portions to define said radially outermost sealing zone,

said supplementary inlet is a ring of openings in the radially outermost of said downwardly and outwardly sloping portions of said first-mentioned cover, and

said second cover has an outside diameter less than that of said first mentioned cover.

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